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characters of some feldspars. More than 400 determinations of the optical constants of feldspars from numerous localities were made, including sixty-four varieties of oligoclase and andesine and thirty-seven varieties of albite. Only mineralogists who have been engaged in this kind of work can appreciate the labor involved. The results will be of importance in showing how far feldspars can vary from the type form while preserving their identity, and in distinguishing between such variations and the mixture or alternation of different species. Among the specimens examined is the moonstone from Mineral Hill, Penna., which is determined to be a *peristerite*, containing probably certain admixtures of oligoclase.—Some very beautiful transparent groups of apatite crystals have been found in the Untersulzbachthal, in Salzburg. They have a white color with a delicate tint of mauve. The largest of the specimens, so far found, has been deposited in the South Kensington Museum. They are beautifully terminated by a number of planes, and have an unusual luster.—The Oregon nickel ore is found in two varieties, which analysis has shown to be almost identical with the ores from New Caledonia—*garnierite* and *noumeite*. They also occur under precisely the same geological conditions. *Garnierite* has a pale apple-green color, adheres to the tongue, is not unctuous and falls to pieces in water. *Noumeite* is darker, does not adhere to the tongue, is unctuous, and does not fall to pieces in water. *Noumeite* contains more water than *garnierite*.

#### BOTANY.<sup>1</sup>

ELLIS' NORTH AMERICAN FUNGI.—In April the tenth and eleventh centuries of this important distribution were received, and a few days later Mr. W. C. Stevenson's Alphabetical Index to Centuries I to x. By means of the latter we are able to make a hasty analysis of the first thousand specimens. Running it hurriedly we note about half a dozen *Myxomycetes* and the same number of *Mucorini*. The *Peronosporæ* are represented by three species of *Cystopus* and twelve of *Peronospora*. In the order *Perisporiaceæ* there are twelve species of *Microsphæria*, three of *Erysiphe*, and six of *Uncinula*. *Tuberaceæ* are represented by but a single species. Under *Helvellaceæ* the genus *Peziza* is represented by sixty-eight species, while of *Pyrenomycetes* there are of the principal genera as follows: *Diatrype* 14 species, *Dothidea* 13, *Hypoxydon* 13, *Hysterium* 11, *Nectria* 16, *Sphæria* 68, *Valsa*, 39. In the *Uredineæ*, *Æcidium* has 14 species, *Phragmidium* 4, *Puccinia* 19, *Uromyces* 15, and in *Ustilagineæ* of *Urocystis* 2, and *Ustilago* 5. Half a dozen or so species represent the *Gasteromycetes*, while of *Hymenomycetes* there are of *Agaricus* 10 species, *Corticium* 23, *Hydnum* 14, *Irpex* 5, *Marasmius* 9, *Stereum* 14. The order *Saprolegniaceæ*

<sup>1</sup> Edited by PROF. C. E. BESSEY, Ames, Iowa.

is the only one of the ordinary Fungi which is not represented by specimens. It will be seen by the above that this distribution is one of great value to the student of any department of fungology, as the specimens are not confined to any restricted group of orders. The excellent index makes it an easy matter to find any species, and possessors of the work will thank Mr. Stevenson for compiling it.

Century XI is of unusual interest, as it is a special one devoted to the Uredineæ and Ustilagineæ. In it there are thirty-five species of Puccinia, which added to those in the previous centuries (all in Cent. III) make fifty-four species. Nine specimens of Ustilago and two of Sorosporium represent the Ustilagineæ. In this century a note informs us that the species "have mostly been determined by Dr. W. G. Farlow."

Since writing the foregoing, we have received a second valuable index also by Mr. Stevenson, and entitled "An Index to Habitats," giving in alphabetical order the habitats of the first thousand species. While not of as great value as the specific index, this will also prove to be useful.

NECTAR IN SPERMOGONIA.—Rathay has shown that insects are attracted to the spermogonia of Uredineæ by a sweet secretion. Many species of insects have been seen to visit the spermogonia, and without question the spermatia are carried away by them. One would scarcely have expected such a device in plants so far down the scale of vegetable life.

BOTANY AT THE MINNEAPOLIS MEETING OF THE A. A. A. S.—Botanists will find much to interest them in and about Minneapolis in August at the meeting of the American Association for the Advancement of Science. The collector will be able to add not a few strange Western plants to his portfolio without the trouble of making long trips. Upon or near the university campus he may get *Lygodesmia juncea*, *Artemisia frigida*, *Iva xanthiifolia*, *Petalostemon villosus*, *Pentstemon grandiflorus*, and many others of equal interest. The cliffs of the great gorge of the Mississippi river, just under the university, will entice many venturesome collectors, while others will find the less dangerous marshy land and the sand hills to the eastward not less interesting and profitable. The whole country westward and south-westward of the city is filled with ponds and lakes which teem with an unusual number of aquatic plants, especially of the lower orders. Desmids and Diatoms of rare beauty occur in great numbers, and ought to engage the attention of the microscopists. Charæ of several species abound, and will be in full fruiting stage at the time of the meeting. The larger fungi are likewise represented by an unusual number of species, while the rusts, smuts, mildews, etc., etc., sometimes denominated the micro-fungi, may be picked up almost everywhere. Surely the association has not for many

years met in a more naturally botanical place than Minneapolis will prove to be, and there should be as a consequence an unusually large attendance of botanists and plant collectors.

*EQUISETUM ARVENSE* L., VAR. *SEROTINUM* MEYER.—This “accidental state,” as Gray calls it, has been found in considerable numbers this spring in Central Iowa. The specimens grew intermingled with the ordinary form, and there was nothing, so far as could be observed, in the conditions surrounding them which could account for their abnormal development. An attempt will be made to germinate the spores, should they prove to be perfect.—*C. E. Bessey*.

NEW PLANTS FROM CALIFORNIA AND NEVADA, ETC. I.—*Thelypodium neglectum*, n. sp.: Annual,  $2^{\circ}$ – $5^{\circ}$  high, glabrous throughout; stems stout, erect, striate, branching at the top; leaves oblanceolate, three inches long, all petioled; root leaves irregularly dentate; stem leaves long petioled, usually truncate at base, none but the uppermost entire; dense racemes paniced; pedicels ascending  $1''$ – $2''$  long, sepals whitish,  $2''$  long; petals white, oblanceolate,  $4''$  long; stamens at length surpassing the petals; filaments glabrous; siliques flattened, slightly torulose,  $3'$  long,  $\frac{1}{3}''$  wide, style obsolete.

Vicinity of Santa Cruz and San Francisco, Cal., June, 1881.

*Sisymbrium acuticarpum*, n. sp.: Annual,  $1^{\circ}$ – $2^{\circ}$  high, stem simple or branched above, pubescent below, with scattered retrorse hairs; leaves all petioled; root leaves oblanceolate, obtuse, deeply crenate to almost lobed,  $3'$  long, petiole  $\frac{1}{2}$  the length of blade, which tapers gradually into it; upper leaves lanceolate irregularly dentate, petiole  $1''$ – $2''$  long; inflorescence glabrous and often glaucous; flowers (usually not bracted) and pods sessile, strictly erect; sepals gibbous, yellowish and purplish,  $1''$ – $1\frac{1}{2}''$  long, narrow; petals linear, light yellow,  $2\frac{1}{2}''$  long; stamens only equaling the sepals; pod terete,  $1'$  long, appressed, those near the root retrorsely pubescent, all bayonet-shaped, very acute; style  $1''$  long.

A plant with the habit of *S. reflexum*, and resembling it in the often elongated raceme and in the flowers, but differing in the pod and almost leathery leaves.

Near the head of the Valley of Palms, Mexico, and within a few miles of the California boundary, April 7, 1882.

*Sidalcea calycosa*, n. sp.: Annual,  $2^{\circ}$ – $3^{\circ}$  high, slender, erect, branching toward the top, pubescent, with scattered hairs; root leaves completely divided, long petioled, leaflets 6 or 7, oblanceolate, abruptly acute, tapering at base; stem leaves completely divided, petiole short,  $\frac{1}{4}'$ – $1'$  long, leaflets linear,  $1'$ – $1\frac{1}{2}''$  long; lower stipules linear, acuminate, sparsely serrate; upper stipules broadly ovate, finely serrate, scarious; uppermost stipules nearly orbicular, subtending some of the peduncles,

while the leaf is often wholly absent; flowers rather long peduncled, clustered in heads or spikes; calyx large, loose, scarious or membranous, hirsute-ciliate with very long simple hairs, and also finely pubescent with stellate hairs, segments broadly ovate, abruptly acuminate with a slender point, very finely serrate, 3" long; petals obovate, truncate, or retuse, erose, 6"-10" long, light purple; carpels smooth, deeply striate on the back, reticulated on the sides, very strongly incurved.

A peculiar species, fruiting spikes resemble *Lophanthus* or *Orthocarpus lacerus*.

June 17, 1882, Duncan's Mill, Cal.—*Marcus E. Jones, Salt Lake City, Utah.*

BETTER METHODS OF TEACHING BOTANY.—It is encouraging to notice from year to year a decided tendency in this country towards better methods of teaching botany in the schools and colleges. The idea is gaining ground that it is better to study the plant, independently of its classification, more, and the technical matters which have to do with classification, or *identification*, less. A year or two ago Professor Beal in a lecture before the Michigan State Teachers' Association presented very forcibly the objections and absurdities of the old methods, and sketched "The New Botany."<sup>1</sup> The favor with which this paper has been received indicates that the teachers of botany are striving to reach better things. They were ready to take up with the suggestion that pupils should study the plants themselves first; that they should find out by direct examination the structure of branches, buds, leaves, flowers, fruits, seeds, etc., etc. This method makes the fields and woods a great out-of-doors laboratory in which the real work of studying plants is done. Moreover, the object constantly kept before the student is to find out *all* about every plant, not just so much only as will enable him to find its scientific name. Often, in fact, many hours of interesting and profitable study are given to points in structure or physiology which are not made use of in the systematic manuals.

We have now before us a little book,<sup>2</sup> by Professor Macloskie of Princeton, the evident intention of which is to foster the mode of study commended above. A single sentence in the preface will suffice to show this. "It is better," says the author, "and more interesting to spend the leisure of a whole season on a single species than to hurry over a large number merely for the sake of discovering their names." This certainly is the right doctrine to inculcate, and while we should not take exactly Dr. Maclos-

<sup>1</sup> The New Botany: A lecture on the best method of teaching. By W. J. Beal, M.Sc., Ph.D. From the Trans. of the 29th meeting of the Mich. State Teachers' Association.

<sup>2</sup> Elementary Botany, with Students' Guide to the Examination and Description of Plants. By George Macloskie, D.Sc., LL.D., etc. New York, Henry Holt & Co., 1883.

kie's plan as outlined in his book, yet the book will probably do good in directing the attention of teachers and students into better lines of work.

Twenty-five pages at the beginning of the book are devoted to the examination of the morning glory, and it is not too much to say that any student who will carefully go through the work indicated here will have a better knowledge of the structure of a flowering plant than could be acquired by the "analysis and classification" of a dozen or more plants in the old way.

The last fifty pages constitute the guide to the examination and description of plants. Here again the student's attention is directed to finding out what the *structure* of the plant is, and little or nothing is said about the matter of determining the plant's place in any system of classification.

With the part of the book intended for the general reader we have strictly nothing to do in this article; however, it may not be out of place to say that the author has presented in plain and non-technical English the principal facts as to the structure of the flowering and flowerless plants. Some errors of statement mar the pages here and there, due, doubtless, to hasty writing. Thus "All dicotyledonous plants have *open* bundles" requires modification; so, too, the statement that the ducts in the rattan cane afford a "free passage-way for the sap;" and that the large intercellular spaces of aquatic plants are "for economizing material."—*C. E. Bessey*.

BOTANICAL NOTES.—A. P. Morgan continues in the Journal of the Cincinnati Society of Natural History his Mycologic flora of the Miami valley, giving descriptions of sixty-six more species of *Agaricus* belonging to the sections *Hyporhodii*, *Dermini*, *Pratelli*, and *Coprinarii*. This paper brings the number of species of *Agaricus* up to one hundred and forty-six.—J. C. Arthur's paper "Some Algæ of Minnesota supposed to be Poisonous," from the bulletin of the Minn. Acad. Nat. Sci., Vol. XI, possesses unusual interest. Certain Nostocaceous algæ appear from the evidence to have caused the death of many domestic animals which drank of the waters of the lake at Waterville. The particular species which seems to have proved fatal is the *Rivularia fluitans* of Cohn. It occurs as little gelatinous balls "of the size of a turnip seed," studded with innumerable little points, giving them a bur-like appearance. They were afterwards found in small quantities in Lake Phalen, from which the water supply for the city of St. Paul is obtained. In the words of the author, "This discovery lends great additional interest to the real character of the Waterville plant."

#### ENTOMOLOGY.<sup>1</sup>

CAPRIFICATION.—We referred in the June number to interesting articles from Westwood and S. S. Saunders on the fig caprifi-

<sup>1</sup> This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., may be sent.